Policies to Induce Structural Change in the British Columbia Economy*

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Provincial government economic and industrial development policies in British Columbia have long been associated with the desire for diversification of the economy to achieve better economic performance. The quest for a more diverse economy less dominated by natural resource industries has become more intense in recent decades as B.C.'s relative economic performance has lagged other provinces.[1] This has involved government policies, institutions, and expenditures. We are interested in exploring how effective some of these efforts have been in achieving their objectives over the period since 1965.

We begin with an overview of the theoretical and applied literature on regional economic diversification and the nature and effectiveness of development policies and programs. A review of the B.C. economy follows; its focus is on structural change and relative performance. Next, the priorities, institutions, instruments, and expenditures connected to economic and industrial development in British Columbia since the 1960s are examined. An index measure of structural diversity is used to analyze the impact of industrial development policies and expenditures. The final section concludes that B.C. government economic development initiatives probably have had only a limited effect on diversification and economic performance.

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1. This lag has been greater in some regions of B.C. than others. See, for example, Davis and Hutton (1989).

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Explaining Changes in Regional Economic Structure

Theories and Policies

Three approaches to regional economic growth can be used as a basis for examining the effects of economic development policies. The export base approach, where a regional economy's increasing exports power GDP growth through an expenditure multiplier (or cause it to diminish when exports decline), is familiar and quite popular. A second approach to regional growth focuses on decreases in production costs and the effect this has on lowering prices and stimulating demand for regional production. This emphasizes new investment and human capital improvement. Finally, endogenous growth approaches focus on the role of technology and the advantages in innovation that accrue to firms in economically advanced regions. Since all three approaches have some currency in the regional science literature and since all also have certain appeal to politicians and policymakers, it is not surprising that each is used to support a wide assortment of economic development measures.

A variety of economic and industrial development policies and expenditures might be expected to influence macroeconomic change, including inducing transition to an economy that is more diversified. Financial assistance through tax abatements could stimulate business investment; industrial promotion activities might be expected to have a similar effect; export promotion could result in higher levels of international exports; support of research and technology might be expected to accelerate the transition to a new economic structure; subsidies to declining industries might have the effect of delaying structural change. A major difficulty in determining whether any of these effects have actually occurred in British Columbia is the relatively small scale of industrial development expenditures and the uncertain effects of development policies in an economy influenced by diverse market forces.

Practical difficulties emerge when it is necessary to establish the details of programs to stimulate export demand (in a complex and dynamic multilateral trading world, how much difference will the actions of one state or provincial government actually make to the export fortunes of the jurisdiction's firms?) or lower production costs by reducing taxes (will reductions large enough to be successful be politically and fiscally feasible?) or nurture competitive clusters as advocated by Michael Porter (2000) (in a market economy, how can government-led intervention to establish viable clusters be implemented?). A further complexity is determining how much expenditure on any program is warranted.

Because of these difficulties, most governments operate quite a large number of economic development programs simultaneously (Bingham et al 1990). Evaluation and administrative experience lead to the modification or elimination of programs that are judged to be problematic but discarded programs are often replaced with new or reworked programs. So, we might expect an elaboration of development policies and programs in the policy arsenal of the B.C. provincial government over the 35-year study period. A multiplicity of programs that try to achieve similar objectives makes it more difficult to ascertain the effects of any particular program.

Diversification

Regional industrial specialization is a venerable topic in regional science (Rodgers 1957). Specialization could be measured in terms of inputs, outputs, markets, or employment. This paper uses industry-level output at a fairly high level of aggregation; a finer level of aggregation or a different measure might have shown different results. The theoretical arguments for specialization versus diversification give mixed advice. A region's economy might be specialized if the various advantages attached to specialization in trade theory were important or if industry-level economies of scale were present (Krugman 1991). On the other hand, since all industries experience cyclical and secular fluctuations, there may be economic influences towards diversity that originate in external agglomeration economies that influence many industries. Sometimes, governments will employ diversification policies to moderate fluctuations across a diverse regional industrial base (Gilchrist and St. Louis 1991).

The usual focus of research on regional industrial specialization has been to study the advantages of diversification (non-specialization) in reducing unemployment or fluctuations in employment. It is hypothesized that more diverse regional economies are less subject to instability associated with reliance on single industries which inevitably experience declining markets or, in the case of resource-intensive industries, depletion or degradation of the resource endowment. Either leads to unfavorable effects on regional economic performance. Summaries of this research are presented in Malizia and Ke (1993) and Siegel et al (1995). While the conclusions of this research are rather variable (perhaps due to differences in geographic areas, in measures of diversification and instability, or in time period), most of it has found that diverse regional economies have less instability.

Regional Economic Development Policy

United States

There is a large literature on state and local economic development policies in the United States. One leading reference (Eisinger 1988) has almost 25 pages of bibliography and perusal of any issue of one of the leading specialized academic journals, *Economic Development Quarterly*, would reveal a substantial expansion in reference material over the last decade. For the purposes of this paper, there are six themes in the research literature that seem especially relevant.

- Some studies limit the scope of economic development policies to those that involve industrial relocation incentives. A broader perspective is more typical

and here we use a broader definition that also includes facilitation, information and marketing, entrepreneurial development, and general economic development measures. Leicht and Jenkins (1994) classify economic development strategies according to their major characteristics: entrepreneurial development, industrial recruitment, and deregulation. A large array of policies and measures is in use -- for example, Isserman (1994) catalogues almost 20 and Eisinger (1988) has even more.

- Even with relatively easily quantifiable measures such as tax abatements and subsidies, it is quite challenging to assess the importance and effect of particular industrial incentives. According to Fisher and Peters (1998), the preferred approach is to assess the value of incentives to firms using a "hypothetical firm" model.
- The controversy over the basic economic rationale for locationally focused economic development policies is unresolved. Some argue that these policies inevitably distort firms' optimal location decisions but others claim that the locational decisions influenced by such policies may correct what would otherwise be mistakes made in response to signals from imperfect markets (Eisinger 1988).
- There is considerable fluctuation in state government support for particular arrays of policies and levels of funding. This may reflect "learning" from experience or it may be the result of other influences on state government decision-making (Eisinger 1995). In many states, for example, economic development policies are viewed as counter-cyclical -- something to be expanded when the state economy is in trouble (Isserman 1994).
- Demand-based policies, which try to shift demand for products of state industries, have tended to displace supply-based policies, which try to lower industry's costs (Eisinger 1988). Recently, more policy emphasis has been given to "Third Wave" facilitation-type, community-focussed programs (Bradshaw and Blakely 1999) but their impact is difficult to evaluate.
- The most convincing empirical conclusion about the effectiveness of any type of economic development policy is that tax reduction policies do make a difference in firm location decisions (Bartik 1991).

Canada

There is less published academic research dealing with the similar activities of Canadian provincial governments although there is a large literature on federal government activities in this field. Good overviews of this are presented by Savoie (1992) and McGee (1992). Atkinson and Powers (1987) review the Industrial Regional Development Program that was established in 1983 when the Department of Regional Economic Expansion (DREE) and the Department of Industry, Trade, and Commerce were merged. Their analysis is highly critical of the divergence between operational decisions and the stated goals of this program and in particular questions the generosity of funding decisions. The most comprehensive account of a provincial economic development program is Savoie's (2001) book on the

McKenna era in New Brunswick. Premier McKenna's focus on self-sufficiency and a business-friendly policy environment is credited with some success in improving New Brunswick's economic performance. Ruggeri (2002) explores the interactions between fiscal capacity and business subsidy programs, federal and provincial, across the provinces. Using Statistics Canada's Provincial Economic Accounts, this study finds that total federal and provincial subsidies to business in B.C. were the second lowest among the provinces as a percentage of private sector GDP in 1992 and only 60 % of the national average. Industrial development programs are more and more focused on innovation. Holbrook and Wolfe (2000) is an edited volume of studies of regional innovation systems in Canada. One of their case studies deals with the Okanagan region and identifies the problems faced by non-metropolitan regions in maintaining competitive innovation and discussed possible roles for government.

Comprehensive surveys of B.C. government policy-making (e.g. Carty 1996) do not provide in-depth assessments of the economic diversification efforts of various provincial governments in B.C., although they do include this as a policy issue. There are many popular studies of general B.C. government economic policies (e.g., Allen and Rosenbluth 1986) and many academic studies of natural resource policies, especially forest and land use planning policies (e.g. Cashore et al 2001; Hayter 2000; and Wilson 1998) but there is no published research that attempts to measure the efficacy of overall economic development policies in British Columbia. There is some literature that evaluates the programs of extra-departmental government agencies including studies by Colgan (1997) on the B.C. Roundtable on the Environment and the Economy and Ohashi (1980) on the British Columbia Resources Investment Corporation.

The British Columbia Economy

Industry Structure

B.C.'s economic base has long depended on exports of goods and services to international markets. Exports to other countries are 2.5 times larger than exports to other Canadian provinces and there has been a particularly rapid growth in exports to the United States, partly as the result of trade liberalization under NAFTA and partly because Asian markets slumped after 1997. Nevertheless, British Columbia is less dependent on the U.S. market than most Canadian provinces.

British Columbia has five important industries founded on its natural resource endowment -- forest, agriculture, mining, energy, and fishing. The B.C. economy has undergone substantial restructuring over the study period. The resource industries' share of total output and employment has steadily decreased while new economic activity in high technology, business services, and tourism has flourished. None of these sectors is as important as the resource industries but all have grown rapidly. They should have less impact on a natural environment perceived

by many British Columbians as more and more at risk. Also, these sectors match the expectations of the large number of immigrants who have come from Asia in the last 15 years expecting good urban employment opportunities. Increasingly, the attention of policy-makers in both the private sector and government has been directed away from the resource industries that played such a large role in shaping British Columbia.

The most important resource industry is the forest industry. It directly employed about 87,000 persons in 2002[2], a decrease of about 22 % from its historic peak in 1981 and 18 % from its recent peak in 1995. In fact, the forest industry's share of total employment and GDP has been falling for decades. The timber harvest peaked in 1989 and is now about 15 % lower. The reduction is partly the result of new land use priorities that reserve a larger part of the forest for non-timber use such as parks. Despite its decline, the forest industry is still the province's most important industry and its impact on employment and output across the whole economy is made larger through indirect employment and output that are dependent on harvesting and processing timber. Indirect output and employment may be equal to the forest industry's direct output and employment. Government policy is pervasive and of immense importance to the industry since most forest land in B.C. is Crown-owned.

In British Columbia, as in other advanced economies, about 75 % of output is in the service sector. Much service sector output and employment is driven by purchases or consumer spending from basic industries. But the major impetus for the increased service sector share comes from rising consumer demand for services. In terms of 2002 output, the seven largest service industries (NAICS aggregations) in the B.C. economic accounts are finance, insurance and related; health care and social assistance; retail trade; transportation and warehousing; public administration; educational services; and information and cultural industries. Together these account for over 55 % of total GDP at Basic Cost and 52 % of total employment (BC Stats 2003).

Service industries can be basic industries in their own right. Successive British Columbia governments have sought to promote service-type economic activity that could be a successful export as the province experiences a transition away from reliance on natural resource commodities and products. For example, tourism, which is split about 50-50 between spending by British Columbians on vacation in the province and by visitors from elsewhere (BC Stats 1999), is a large industry in B.C., directly accounting for about two-thirds as much GDP as the forest industry.

Other efforts to find an export base in the service sector have centered on financial services and the high technology sector. While the statistical FIRE (finance, insurance and related) classification is the largest single industrial sector in provincial GDP, its employment share of about 6 % is probably a more useful measure of its structural importance. So far, most economic activity in the FIRE

2. Unless otherwise noted, all economic statistics are from British Columbia, Ministry of Finance (various years).

sector has been directed at the provincial economy, not on export markets. British Columbia's exports of transportation services such as those provided by the Port of Vancouver are four times larger than its exports of financial services.

High technology, which involves the application of knowledge-intensive processes to the production of goods or the delivery of services, may offer more potential. B.C.'s interest in promoting this sector is, however, shared by every other jurisdiction in North America. Everyone would like to have its low pollution, high wages, and growth potential. High tech industries in B.C. are now about half the size of tourism but their recent growth has been much faster.

Economic Trends

Our study period starts during the long postwar economic boom. In British Columbia, this finally ended in the early 1980s. The recession that followed was deep and GDP did not recover its 1981 level until 1985. As migration declined, the rate of population growth lagged and during the 1980s was the lowest since the 1930s. Yet this slowdown needs to be viewed in context with the rapid development of the province's resource industries that had preceded it. This was bound to end as further expansion in resource extraction became impossible, world markets began to be served by competing suppliers, and questioning of the environmental and the social consequences of continued rapid economic growth became more intense. The pressure for restructuring the economy has been strong since the early 1980s although it lessened somewhat during the immigration and population boom of the early 1990s. Since then, virtually every measure of B.C.'s economic performance has declined and is now below the levels of ten years ago (BC Progress Board 2002). There is now intense general and government interest in the future path of the provincial economy.

The most important trends over the whole 1965-2002 period are as follows.[3]

- Annual population growth averaging 2.25 %.
- Generally decreasing rates of annual GDP growth and, especially, annual growth in GDP per capita.
- Rising unemployment rates peaking in 1984 with declines generally since then, but not to the lower levels of the 1960s.
- Per capita income levels, once among the highest of any province, now below the Canadian average and well below those of Alberta and Ontario.
- Increase in the services share of GDP from 63 % in 1965 to 76 % in 2002. with corresponding decreases in the share of natural resource industries.
- From 1990 to 2000, increases in exports relative to GDP following declines in the early 1980s; decreases in 2001 and 2002.
- Business investment accounting for between 14 and 20 % of GDP with decreases from 1981-86 and since 1994.

3. Some of these data are from Statistics Canada (2003).

- Government expenditures maintaining a 20 to 25 % share of GDP with increases from 1965 to the early 1980s and again from 1988-94; decreases since then.

Economic and Industrial Development Policy in British Columbia

There have been few over-arching statements of economic development policy in British Columbia. Instead, various governments have made limited statements concerning their view of the best development path for the provincial economy[4] (British Columbia 1995). These have not varied much even though the political complexion of governments has changed. Since 1965 there have been 24 years of Social Credit government, 2 years of Liberal government, and 13 years of New Democrat government. Within each period there have been differences in priorities and methods but there has been remarkably little difference in the statements about economic development policy.[5]

The provincial government department with responsibility for economic and industrial development in 1965 was the Department of Industrial Development, Trade, and Commerce. This department had been created in 1937 as the Department of Trade and Industry, which succeeded the Economic Council of British Columbia (1934-37). The Council was one of the agencies and programs created in efforts to move the B.C. economy out of the Great Depression (Ormsby 1962). Over the years, the name of this department changed several times. Table 1 lists the B.C. government ministries[6] responsible for industrial development from 1965 to the present. Separate ministries for the tourism industry existed between 1967 and 1993.

Following Dorcey (1987), there is some indication that new governments sought to present a new approach to industrial development by altering ministry titles or responsibilities. At the least, the changes in nomenclature reflect changes in emphasis and scope of the unit's responsibilities. The first name, Industrial Development, Trade and Commerce, suggests an emphasis on existing industries and exports; the shift to "Economic Development" in 1975 implies a broader view of the structural potential of the B.C. economy. The 1990s "Employment and Investment" identifies desired outcomes for government development policy and the most recent "Competition, Science, and Enterprise" refers to elements believed to be conducive to economic development. Although the shelf life of ministry

4. More ambitious and broader visions from academics are available in Hutton (1993) and Goldberg (1998). Recently the BC Progress Board has set out very specific long term social and economic goals (BC Progress Board 2002).
5. Other policies can affect industrial location. The New Democratic Party often supported legislation and policies that favoured trade unions over management while the Social Credit party did not (Barman 1996). Such favouritism can be an important consideration in industrial location decisions (Holmes 1998).
6. Government departments became government ministries in 1976. There was no apparent functional significance associated with this change.

TABLE 1 Names of Industrial Development Departments and Ministries, 1965-2002

Years	Name	Government
1965-74	Industrial Development, Trade and Commerce	Social Credit, NDP
1975-79	Economic Development	Social Credit
1980-85	Industry and Small Business Development	Social Credit
1986	(1) Industry and Small Business Development (2) International Trade and Investment	Social Credit
1987-88	Economic Development	Social Credit
1989	Regional Development	Social Credit
1990-91	(1) Regional and Economic Development (2) International Business and Immigration	Social Credit
1992-93	Economic Development, Small Business and Trade	NDP
1994-2000	(1) Employment and Investment (2) Small Business, Tourism and Culture	NDP
2001-02	Competition, Science and Enterprise	Liberal

nomenclature has often been short, the durability of ministry-level attention to economic development since 1965 (and earlier) is noteworthy.

Study of the stated objectives of these ministries provides a more detailed perspective on objectives and priorities. In 1965, the Department's annual report (Department of Industrial Development, Trade, and Commerce 1965) included the following industrial development policy objectives.

- To promote new industrial and commercial enterprises throughout the province.
- To provide assistance when necessary to established businesses.
- To develop domestic and export trade.
- To provide industry with information related to locational decisions.
- To advise the government regarding matters of economics and industrial development, to undertake a broad range of economic research, and to collect relevant statistical information.

The first and fourth of these could be identified as promoting diversification but they could also be seen as support for the existing industrial structure.

Perusal of 35 annual reports of these ministries yields a long catalogue of aspirations and intentions. The original 1965 set of five objectives has remained over the entire 35-year period, at least implicitly, and many of the additions were semantic rather than substantive. However, there have been some significant new directions and emphases.

- an expanded economic base and increased employment (1972)
- diversification of the provincial economy especially by increasing value-added processing (1973/74)
- explicit inclusion of small business (1976/77)
- responsibility for a provincial economic strategy (1976/77)
- coordination of development-related activities of other government ministries

and agencies, including federal-provincial programs (1978/79)
- mention of Pacific Rim export markets (1981/82)
- promotion of a positive climate for business investment (1986/87)
- requirement that economic growth be environmentally sound (1988/89)
- management of public lands for development and conservation purposes (1988/89)
- promotion of development for the Native peoples (1988/89)
- mention of community economic development (1991/92)
- reference to high technology industries (1991/92)
- mention of sustainable growth (1992/93)
- responsibility for integrated planning of government capital expenditures (1993/94)
- focus on private sector initiatives facilitated by an attractive investment environment (2002/03)

A variety of other government organizations have been assigned responsibilities for specific economic development policies and measures. Governments have often viewed these as significant elements in their development strategies. The British Columbia Railway is a well-known example of one of these organizations used as a development tool (Wedley 1998). Table 2 lists some of these organizations and their dates, policy functions, and importance.[7]

This review omits the pervasive influence of the resource ministries of government on the operations, investment, and profitability of resource industries. Both the Ministry of Forests and its close affiliate, Forest Renewal B.C., and the Ministry of Energy and Mines have wielded substantial regulatory and financial power over the forest, mining, and energy industries. Some important economic development initiatives have simply been pursued outside any formal organizational structure. Examples are the Northeast Coal Project of 1981-84 involving provincial government infrastructure expenditures of approximately $500 million and the $450 million Fast Ferry Project of 1997-2000.

The most recent change in government in June, 2001 brought a new approach to industrial development policy. Earlier NDP and Social Credit governments had both used government funding as a significant element in their efforts to encourage investment and diversify the economy. The new Liberal government's emphasis is on creating a business-friendly investment climate through lower taxes and less regulation. There is still a government ministry with industrial liaison and development responsibilities but there are to be no explicit subsidies for business firms. The current Ministry of Competition, Science and Enterprise has objectives that are in many ways quite similar to those set out by earlier B.C. governments but it is not assisted by an array of special funding programs. Also, the range of auxiliary organizations involved in industrial development has been considerably reduced. There is still, however, substantial involvement in facilitation and promotion endeavours that probably constitute subsidies to some degree for the firms and industries that are involved. These activities seem to be concentrated in the high technology and tourism segments of the B.C. economy.

7. Importance is based on a subjective appraisal of the amounts expended and the organization's scope.

TABLE 2 Other B.C. Government Economic and Industrial Development Organizations

Name	Period of Development Emphasis	Function	Importance
British Columbia Railway (earlier Pacific Great Eastern Railway)	1965-88	Stimulates northern economic development by providing expanded transportation	Major
British Columbia Hydro and Power Authority	1965-	Encourages economic development by constructing and operating low cost hydroelectricity generating facilities	Major
Ocean Falls Corporation and British Columbia Cellulose Co.	1973-85	Operates pulp and paper mills under government ownership and subsidy	Minor
British Columbia Development Corporation	1973-87	Creates industrial parks and loans to stimulate industrial development	Minor
Science Council of British Columbia	1978-	Promotes economic development and enhances the quality of life through innovative applications of science and technology	Major
British Columbia Resources Investment Corporation	1979-91	Privatizes government investments in forest products and other resource industries	Major
Discovery Foundation	1982-	Promotes research parks at post-secondary institutions	Minor
B.C. Trade Development Corp.	1989-96	Promotes exports B.C. goods and services	Minor
B.C. Roundtable on the Environment and the Economy	1990-92	Develops strategies for sustainable economic development	Minor
Job Protection Commission	1991-2002	Assists businesses facing closure by creating solutions to their problems	Minor
Working Opportunity Fund	1991-	Operates "Employee Venture Capital Fund" that finances certain types of small- and medium-sized B.C. firms	Major
Commission on Resources and the Environment	1992-96	Establishes a system of provincial land use and resource management plans	Major
Columbia Power Corporation	1994-	Enters into joint ventures to develop hydroelectric projects in the Columbia River basin	Minor
Columbia Basin Trust	1995-	Uses downstream benefits under the Columbia River Treaty to create sustainable development opportunities	Major
Tourism British Columbia	1997-	Receives net revenue from provincial hotel room tax and spends it to promote development of the tourism industry	Major
552513 British Columbia Limited (Skeena Cellulose)	1997-2002	Holds the government investment in a pulp mill and provides it financial support	Minor
Northern Development Commission	1999-2001	Facilitates northern economic development by coordinating government activities and promoting private-sector investments	Minor
BC Progress Board	2001-	Provides advice and benchmarks on economic performance	Major
Premier's Technology Council	2001-	Advises on technology-related issues	Minor

Measuring Government Economic Development Activity

In order to analyze the effects of economic development policy, we need some measure of policy activity. The most attractive measure is expenditures since expenditure levels should help to sort policies and programs that are rhetorical window-dressing from those with real activity. There are several choices for industrial development expenditure data. Each government ministry has an annual budget and at the end of each fiscal year the actual expenditures against this budget are reported by the provincial Auditor-General in a *Public Accounts* document. *Public Accounts* also contains a classification of expenditures by function and one of the functions listed is titled "trade and industrial development" or "trade and industry". No definition of these terms is provided and reconciliation with ministry expenditure totals is difficult but it seems that this is the best single number to measure the government's activity in industrial development by year over the study period. The *Public Accounts* functional expenditure data do cross ministerial boundaries although they do not include development-related expenditures of government corporations and it is not clear that expenditures from special funds are always captured. The Provincial Economic Accounts prepared by Statistics Canada include data on government subsidies but it is difficult to reconcile this data with other sources.

Table 3 shows the levels of "trade and industry" expenditure reported in *Public Accounts* for the 1965-2002 period in both nominal and real terms.[8] However, even if this data did capture all ministry industrial development expenditures, it would not include two other important categories of expenditures. These are infrastructure expenditures (mainly by Crown corporations) and tax expenditures incurred as firms take advantage of certain tax abatements that have been associated with some industrial development programs.

These data show an irregularly increasing level of real expenditure on industrial development and as a share of total B.C. government expenditure. Total B.C. government expenditures in 2003 were over $26 billion and the priority for industrial development expenditures needs to be viewed against this. The two highest levels of real industrial development expenditures occurred under Social Credit governments in 1986 and 1991. The most recent year's total of less than $49 million is the lowest in real terms since 1977 and the lowest as a share of total B.C.

8. The conversion to real expenditures uses the implicit GDP deflator for current government expenditures. Fiscal years ending March 31st are reported as the previous year because it includes 9/12 of the fiscal year's amount.

TABLE 3 Industrial Development (Trade and Industry) Expenditures, 1965-99

	Current Dollars ($ thousand)	Constant Dollars (1986 $ thousand)	Government
1965	1812	10354	SC
1966	2714	14489	SC
1967	4405	22231	SC
1968	5714	27275	SC
1969	5163	23446	SC
1970	4654	18613	SC
1971	4338	15122	SC
1972	5055	16608	SC
1973	8118	24743	NDP
1974	15694	41237	NDP
1975	17056	39797	NDP
1976	20166	41893	SC
1977	22330	42934	SC
1978	44502	81003	SC
1979	68165	112333	SC
1980	87383	127650	SC
1981	88309	110543	SC
1982	59809	66279	SC
1983	60757	64293	SC
1984	52352	54257	SC
1985	66510	67999	SC
1986	218311	218311	SC
1987	102746	98659	SC
1988	158701	148298	SC
1989	149345	132567	SC
1990	158562	133323	SC
1991	342019	271616	SC
1992	131589	99774	NDP
1993	151528	113220	NDP
1994	186088	136214	NDP
1995	163888	117323	NDP
1996	153079	108464	NDP
1997	117443	75953	NDP
1998	111753	71162	NDP
1999	182416	115126	NDP
2000	110517	67675	NDP
2001	89457	54438	Liberal
2002	82141	48857	Liberal

Note: 1. SC = Social Credit; NDP = New Democratic Party
Source: Ministry of Finance, *Public Accounts*, various years.

government expenditures for the entire study period. Figure 1 shows these expenditures as a share of total government expenditures for 1965-99; the temporal patterns are similar to the raw expenditure data.

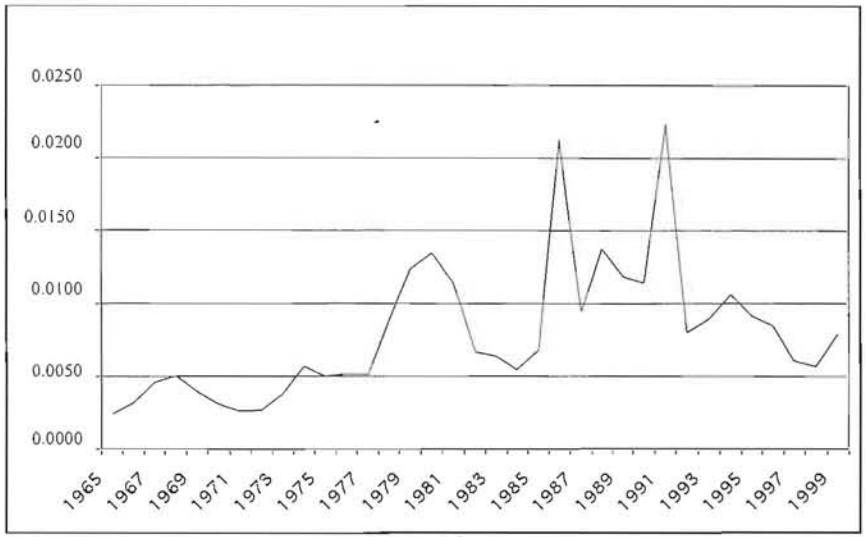

FIGURE 1 Trade and Industry Expenditure , 1965-99

Measuring Diversity in the B.C. Economy

Defining the Economic Base

If we accept the export base model of a regional economy, then the most important issue in diversifying the economy is diversifying the economic base -- in effect, diversifying the export sectors of the economy. Identification of the sectoral composition of the export base in a regional economy is a long-standing empirical problem. Often, location quotients are used to identify sectors that are more important regionally in terms of employment or output than national or rest-of-country averages. Another approach is to determine the exporting sectors by examining the commodity composition of regional exports. This is the method used here.

Because of data limitations, we can only consider international exports of goods. In B.C., international exports of goods and services are two times larger than interprovincial exports.[9] The percentage division of B.C.'s 2000 exports of $63 billion is shown below.

	International	Interprovincial
Goods	50	14
Services	17	19

9. BC Stats, 2004. B.C.'s largest interprovincial export by far is transportation and storage, dominated by use of the railways and the Port of Vancouver to move products from other provinces to their export markets.

TABLE 4 British Columbia's International Exports of Goods, Selected Years, 1965-2002 ($ Million)

	1965	1980	1991	1995	2000	2002
Lumber	365	2462	3648	7317	6827	6343
Pulp	181	1898	2479	5541	4488	2811
Newsprint and Paper	134	773	1472	2451	2076	2258
Aluminum	56	442	324	518	623	452
Fish	49	275	696	851	895	1014
Copper	31	429	702	862	413	349
Coal	--	515	1538	1421	1332	1373
Natural Gas	23	465	297	503	2479	1693
Zinc	47	145	213	224	453	311
Total 9 Commodities	886	7404	11369	19688	19586	16604
Total World Exports	1219	9654	15215	26911	33441	28843
Nine/Total	0.726	0.767	0.747	0.732	0.586	0.576

Extended data on the commodity composition of exports are only available for international exports of goods but these are almost 60 % of total exports. International trade in leading resource products is shown in Table 4 for selected years from 1965 to 2002. Table 4 shows export product diversification since 1995 -- the nine resource commodities, which for 30 years accounted for around 75 % of B.C.'s international goods exports, now account only for about 58 %.

This view of B.C.'s commodity export profile leads to selecting the following ten SIC industries[10] as its economic base:

- Fishing, trapping and related
- Forestry and wood
- Paper and allied
- Metal mining and services
- Coal mining
- Petroleum and natural gas
- Metals and products
- Other manufacturing
- Transportation and storage
- Business services

Seven of these industries are resource-based goods producers. "Other manufactur-

10. NAICS-based GDP by industry was not available back to 1965.

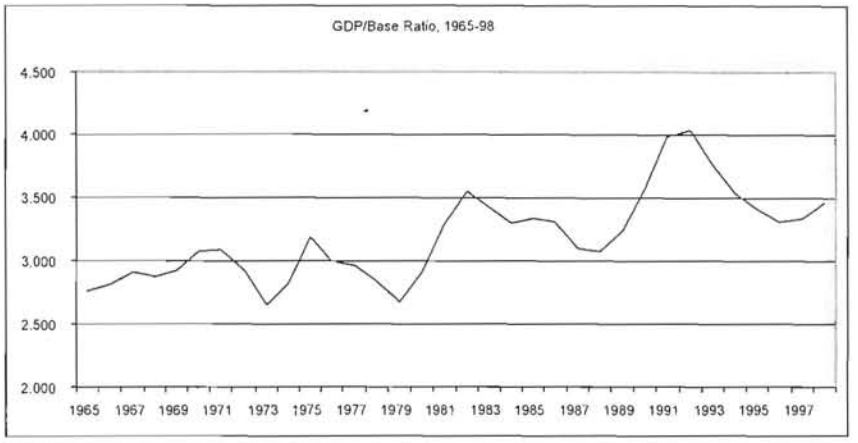

FIGURE 2 GDP/Base Ratio, 1965-98

ing" includes a number of industries that have increased their share of total interna tional goods exports. Within this group, the percentage increase since 1993 in international exports of machinery and equipment and of plastics was three times as large as the increase in total exports. Also, transportation and storage and business services are industry groups that sell an increasing proportion of their output outside B.C.

The ratio between total GDP and base GDP using this definition of B.C.'s economic base is shown in Figure 2. This ratio is equivalent to a simple version of the regional output multiplier. None of the multiplier values is below 2.68, which is too high for a general regional output multiplier and indicates that some exporting sectors have been omitted. The value of the multiplier has increased over time, suggesting that omissions from the economic base are increasing.

Measuring Specialization

There are many ways of measuring regional industrial specialization. These include information theoretic measures such as entropy indices, location quotients, measures of inequality based on the Gini coefficient familiar in studies of income distribution, statistical measures of deviation, and concepts derived from portfolio theory. This last approach is based on the concept that a diverse "portfolio" of regional industries can be analogous to a risk-minimizing portfolio of securities (Lande 1994; Kurre and Weller 1996). Each of these measures has certain advantages and disadvantages (Jackson 1984; Siegel et al 1995; and Isard 1960: Chapter 7). One of the advantages of measuring the level of regional industrial specialization with an entropy index is the prior definition of maximum and minimum values for an economy with a given number of industry sectors.

Our entropy index (Malizia and Ke 1993) is defined as follows:

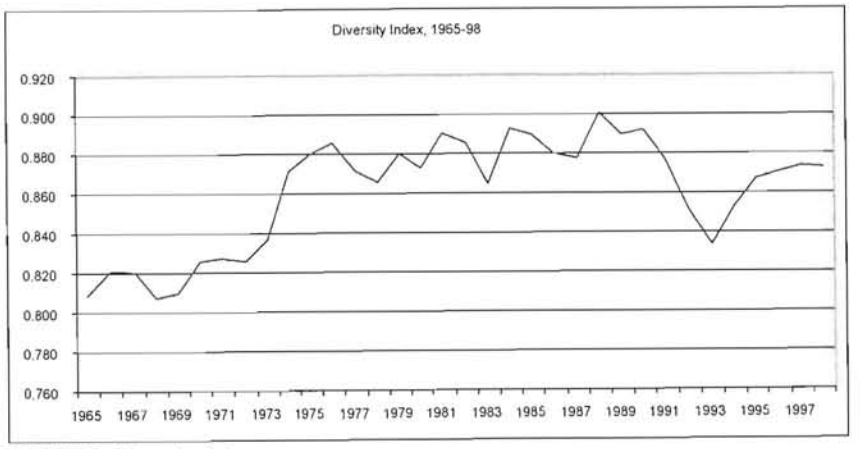

FIGURE 3 Diversity Index

$$DIV_n = \sum_{j=1}^{n} \left(\frac{Q_j}{Q_n} \right) \log \left(\frac{Q_n}{Q_j} \right)$$

where,

DIV_n	=	diversity index value across n industries (n = 10)
Q_j	=	GDP in industry j
Q_n	=	total GDP

Using the 10 industries identified above as comprising B.C.'s economic base, the index has a maximum diversity value of 1.0 (log 10) and a minimum diversity value of zero. At the maximum, output is equal in all industries and at the minimum all output is in just one industry. Any diversity index is, of course, highly sensitive to the choice of sectors. The diversity index increased from 1961 to 1988 but then decreased through 1998 although there is some evidence of a trend to a more diverse economy since 1993. Calculating the economic base diversity index beyond 1998, the last year for which SIC data are available, with a similar, but different, selection of NAICS-based industries shows virtually no change through 2002. Structural changes that move the index higher include output increases in smaller industries and output decreases in larger industries. Over time, this has occurred -- in the 1970s the mining and energy industries increased their shares of total GDP and the forest industry share of GDP decreased. In the 1990s the non-resource industries showed faster growth. Changes in the diversity index are shown in Figure 3.

TABLE 5 Correlation Matrix for B.C. Economic Variables, 1965-2002

	Diversity Index	Real Trade & Industry Expend.	Real Trade & Ind. - 5 yr Average Expend.	Real Bus. Investment	Real ROW Exports	Resource GDP Share	Unemp. Rate	Real GDP Growth Rate
DI	1.0	--	--	--	--	--	--	--
T&I	0.553	1.0	--	--	--	--	--	--
T&I - 5	0.535	0.534	1.0	--	--	--	--	--
BI	0.534	0.656	0.906	1.0	--	--	--	--
Exports	0.447	0.586	0.832	0.894	1.0	--	--	--
Res GDP	-0.631	-0.609	-0.865	-0.887	-0.842	1.0	--	--
Unemp Rate	0.614	0.402	0.540	0.346	0.412	-0.587	1.0	--
Real GDP	-0.305	-0.289	-0.445	-0.374	-0.326	0.586	-0.456	1.0

Impacts of Industrial Development Activities

In this section, we undertake a preliminary analysis of the impacts of industrial development effort on diversity and economic performance. We use four measures of economic performance: real business investment, real international exports of goods, the unemployment rate, and real GDP growth; two measures of diversity: the diversity index and the resource share of GDP: and two measures of industrial development effort: real trade industry expenditures and a five-year moving average of real trade industry expenditures. The correlation between these measures for the 1965-1998 period is shown below in Table 5.

All the correlation coefficients are significant at the t-test 5 % level or better, and most have the expected sign. The positive association between the diversity index and the industrial policy measures and the negative association between the rate of growth of real GDP and all measures except the resource share of GDP is somewhat surprising but could mean that high unemployment and slow growth induce trade and industry expenditures and that a more diverse economy has ameliorated economic conditions that would be worse if the economy had not evolved towards more diversity. The negative association between the unemployment rate and the GDP share of resource industries reflects the generally rising unemployment rate (averaging 5.0 % in 1965-69 and 8.1 % in 1998-2002), probably for reasons at least partly unrelated to the industrial structure of the economy and the quite steady decrease of the resource GDP share to about one-half the level of 35 years ago. The correlation between trade and industry expenditures and economic performance measures is highest for business investment and all correlations using the five-year moving average of trade and industry expenditures are higher than for single year expenditures.

Not surprisingly, two-variable regressions to test the explanatory power of some of these relationships over 1965-98 were unsuccessful. The adjusted R^2 values were as high as .814 but the coefficients, all of which were significant, were either very small, or too large. The estimated effects of an $80 million TI expenditure on various measures are shown below.

	Coefficient of Determination (adjusted R^2)	Mean Value	Estimated effect of $80 million of Trade & Industry Expenditures
Diversity Index	.264	.861	.024
Real Business Investment ($million, 1986)	.814	6372	3392
Real International Exports ($million, 1986)	.683	15159	7240
Resource Share of GDP	.741	.139	.041
Unemployment Rate	.270	8.78	2.264
Real GDP Growth Rate	.173	3.87	-2.81

A hypothetical $80 million spent on trade and industry (5-year moving average) results in a .02 increase in the diversity index. This estimate is not far off the average annual change in the index but it comes from a regression equation that explains less than 30 % of the variation in the diversity index. The next two estimates have much higher R^2 values but the estimated impacts of industrial development policy on real business investment and real international exports of goods are implausibly large -- in the billions from an expenditure level of $80 million. The most likely cause of this is the omission of other variables that are more influential in explaining the levels of investment and exports. The estimates for the impact of trade and industry expenditures on the unemployment rate and the growth rate of real GDP have low R^2 values and, for both unemployment and GDP growth rate very high estimated effects (a 2.3 % increase and a 2.8 % decrease, respectively). The directions of these effects are somewhat counterintuitive (industrial development expenditures increase unemployment and lower the GDP growth rate) but this could reflect weak economic conditions stimulating increased trade and industry expenditures rather than the other way around.

It is important to note that complex macroeconomic relationships are modeled here with two-variable equations. A cautious summary would be that economic and industrial development programs have had an effect on certain aspects of the British Columbia economy but that it would be premature to describe them as important. This is not inconsistent with other research -- Dewar (1998) reaches a similar conclusion about development programs in Minnesota but the barriers introduced by the need there to mobilize business and legislative support would

not be a significant factor given British Columbia's parliamentary government system. It is possible that the small scale of B.C.'s industrial development policy effort -- rarely as high as 2 % of provincial government current expenditures -- is responsible for the weak effects on economic policy objectives.

Conclusions

This paper has presented preliminary results of a study of economic development policy in British Columbia with a focus on trade and industry expenditures (TI). It is inherently difficult to isolate the effects of one type of influence on the evolving diversity and performance of an open regional economy and B.C. is typical in having operated a rather large number of overlapping, if not competing, industrial development programs. Over time, the stated objectives of these programs have moved in directions that were supportive of sectoral diversification of the B.C. economy. In recent years, the economy itself has under-performed in comparison with other provinces and itself in the earlier years of the study period.

There is some evidence to support the effectiveness of TI in improving the performance of the B.C. economy but the effects are not strong. Reasons for this could include the following:

- Trade and industry expenditures as reported in *Public Accounts* understate the full range of government industrial development activities, especially in some years.
- Some programs within the industrial development policy group may have been more effective than others. Governments seem to have been torn between propping up declining industries work and assisting industries with superior productivity potential. Buss (1999) illustrates what is wrong with much industrial targeting and Dinc et al (1998) provide Canadian data that could be used to improve targeting performance.
- The analysis does not take account of fiscal measures including general taxation levels and the use of tax abatements and penalties. Also, evidence for the effects of general fiscal policies is present in the economic development literature (e.g. Gerking and Morgan 1998).
- The major changes in provincial government resource and environmental policies over this period have had significant impacts on the resource industries and on other sectors of the economy that serve this sector. These effects are not included.

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